

What is claimed is:

1 1. A carbon nanocapsule thin film, prepared by
2 electroplating a plurality of carbon nanocapsules onto a
3 substrate.

1 2. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the carbon nanocapsule is a polyhedral
3 carbon cluster constituted by having concentric multi-
4 layers of closed graphitic sheet structure. The diameter
5 of a carbon nanocapsule is about 3-100 nm.

1 3. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the carbon nanocapsule is hollow.

1 4. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the carbon nanocapsule is a metal-filled
3 carbon nanocapsule filled with metals, metal oxides,
4 metal carbides, or alloys.

1 5. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the thickness of the carbon nanocapsule
3 thin film is 20nm-1mm.

1 6. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein a redox agent or an external electric
3 field is applied to offer a driving force for
4 electroplating.

1 7. The carbon nanocapsule thin film as claimed in
2 claim 6, wherein the potential of the external electric
3 field is 0.01V-6V.

1 8. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the carbon nanocapsules comprise a
3 functional group.

1 9. The carbon nanocapsule thin film as claimed in
2 claim 8, wherein the functional group carries at least
3 one positive charge after dissociation.

1 10. The carbon nanocapsule thin film as claimed in
2 claim 9, wherein the functional group is amine or
3 quaternary ammonium.

1 11. The carbon nanocapsule thin film as claimed in
2 claim 8, wherein the functional group carries at least
3 one negative charge after dissociation.

1 12. The carbon nanocapsule thin film as claimed in
2 claim 11, wherein the functional group is carboxyl group,
3 SO_4^- or PO_4^- .

1 13. The carbon nanocapsule thin film as claimed in
2 claim 1, wherein the carbon nanocapsules is 20-100 vol%.

1 14. A carbon nanocapsule thin film preparation
2 method, comprising:

3 providing a substrate; and
4 electroplating a plurality of carbon
5 nanocapsules onto the substrate.

1 15. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the carbon
3 nanocapsule is a polyhedral carbon cluster constituting
4 multiple graphite layers having a balls-within-a ball

5 structure, and the diameter of a carbon nanocapsule is 3-
6 100 nm.

1 16. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the carbon
3 nanocapsule is hollow.

1 17. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the carbon
3 nanocapsule is a metal-filled carbon nanocapsule filled
4 with metals, metal oxides, metal carbides, or alloys.

1 18. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the thickness of
3 the carbon nanocapsule thin film is 20nm-1mm.

1 19. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein a redox agent or
3 an external electric field is applied to offer a driving
4 force for electroplating.

1 20. The carbon nanocapsule thin film preparation
2 method as claimed in claim 19, wherein the potential of
3 the external electric field is 0.01V-6V.

1 21. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the carbon
3 nanocapsules comprise a functional group.

1 22. The carbon nanocapsule thin film preparation
2 method as claimed in claim 21, wherein the functional
3 group carries at least one positive charge after
4 dissociation.

1 23. The carbon nanocapsule thin film preparation
2 method as claimed in claim 22, wherein the functional
3 group is amine or quaternary ammonium group.

1 24. The carbon nanocapsule thin film preparation
2 method as claimed in claim 21, wherein the functional
3 group carries at least one negative charge after
4 dissociation.

1 25. The carbon nanocapsule thin film preparation
2 method as claimed in claim 24, wherein the functional
3 group is carboxyl group, SO₄⁻ or PO₄⁻.

1 26. The carbon nanocapsule thin film preparation
2 method as claimed in claim 14, wherein the carbon
3 nanocapsules is 20-100 vol%.